FORAGE SUITABILITY GROUP
Saline

FSG No.: G102BY895SD

Major Land Resource Area: 102B - Till Plains

Physiographic Features
This group is located on flood plains with high water tables.

	Minimum	Maximum
Elevation (feet):	1000	1950
Slope (percent):	0	1
Flooding:		
Frequency:	Very Rare	Frequent
Duration:	None	Brief
Ponding:		
Depth (inches):		
Frequency:	None	None
Duration:	None	None
Runoff Class:	Low	Low

Climatic Features
Annual precipitation varies widely from year to year in MLRA 102B. Average annual precipitation for all climate stations listed below is about 24 inches. Over 75 percent of that occurs during the months of April through September. On average, there are about 30 days with greater than .1 inches of precipitation during the same timeframe.

Average annual snowfall ranges from 25 to 39 inches across the MLRA. Snow cover at depths greater than 1 inch range from 15 days at Bridgewater to 79 days at Madison.

Average July temperatures are about 75^0F and average January temperatures are about 15^0F. Recorded temperature extremes in the MLRA are a low of -36 degrees and a high of 110 degrees both recorded at Sioux Falls.

Average annual wind speeds at Sioux Falls are 11 mph with the highest wind speeds occurring during March and April. It is cloudy an average of 157 days a year at Sioux Falls, with the greatest incidence of cloudy weather occurring in November and December. Average morning relative humidity in June is 82 percent and average afternoon humidity is 59 percent.

The climate data listed in the tables below represent high and low ranges and averages for the climate stations and dates listed. For additional climate data, access the National Water and Climate Center at http://www.wcc.nrcs.usda.gov.

	From	To
Freeze-free period (28 deg)(days):	139	154
(9 years in 10 at least)		
Last Killing Freeze in Spring (28 deg):	May 13	May 03
(1 year in 10 later than)		
Last Frost in Spring (32 deg):	May 24	May 17
(1 year in 10 later than)		
First Frost in Fall (32 deg):	Sep 10	Sep 19
(1 year in 10 earlier than)		

	From	To
First Killing Freeze in Fall (28 deg):	Sep 19	Sep 30
(1 year in 10 earlier than)		
Length of Growing Season (32 deg)(days):	117	133
(9 years in 10 at least)		
Growing Degree Days (40 deg):	4565	5314
Growing Degree Days (50 deg):	2600	3179
Annual Minimum Temperature:	-25	-20
Mean annual precipitation (inches):	23	25

Monthly precipitation (inches) and temperature (F):

2 years in 10:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Precip. Less Than	0.13	0.19	0.63	1.12	1.56	1.86	1.71	1.47	1.33	0.71	0.20	0.26
Precip. More Than	0.73	1.35	2.33	3.33	4.79	5.83	4.96	4.17	3.71	2.66	1.63	1.04
Monthly Average:	0.47	0.62	1.64	2.36	3.26	3.70	3.17	2.80	2.62	1.66	1.04	0.67
Temp. Min.	2.1	8.2	20.8	34.5	45.9	55.5	60.8	57.9	48.3	36.5	22.5	8.0
Temp. Max.	29.9	35.8	48.2	64.6	75.4	84.7	89.3	86.3	78.1	66.3	48.0	32.9
Temp. Avg.	15.1	21.3	33.5	48.1	59.9	69.4	74.7	71.9	62.2	50.2	34.2	19.7

Climate Station	Location	From	To
SD1032	Bridgewater, SD	1961	1990
SD1392	Canton, SD	1961	1990
SD1579	Centerville, SD	1961	1990
SD5090	Madison Research Farm, SD	1962	1990
SD5228	Marion, SD	1961	1990
SD5481	Menno, SD	1961	1990
SD7667	Sioux Falls, SD	1961	1990
SD8472	Tyndall, SD	1961	1990
SD8622	Vermillion, SD	1961	1990
SD9502	Yankton, SD	1961	1990

Soil Interpretations

This group consists mostly of very deep, poorly drained soils with high salinity.

Drainage Class:	Somewhat poorly drained	To	Poorly drained
Permeability Class:	Moderately slow	To	Moderately slow
(0 - 40 inches)			
Frost Action Class:	High	To	High

	Minimum	Maximum
Depth:	72	
Surface Fragments >3" (% Cover):	0	3
Organic Matter (percent):	3.0	6.0
(surface layer)		
Electrical Conductivity (mmhos/cm):	16	16
(0 - 24 inches)		
Sodium Absorption Ratio:	7	7
(0 - 12 inches)		
Soil Reaction (1:1) Water (pH):	6.6	8.4
(0 - 12 inches)		
Available Water Capacity (inches):	11	11
(0 - 60 inches)		
Calcium Carbonate Equivalent (percent):	5	18
(0 - 12 inches)		

Adapted Species List

The following forage species are considered adapted to grow on the soils in this group. Additional information concerning plant characteristics of a number of the listed species as well as individual cultivars of many of those species can be accessed at http://plants.usda.gov/.

Cool Season Grasses	
Beardless wildrye	G
Creeping foxtail	F
Intermediate wheatgrass	F
Newhy hybrid wheatgrass	G
Pubescent wheatgrass	F
Reed canarygrass	F
Slender wheatgrass	G
Tall fescue	G
Tall wheatgrass	G
Western wheatgrass	G

Warm Season Grasses	
Alkali sacaton	F
Switchgrass	F

Legumes	
Alfalfa	F
Alsike clover	F
Birdsfoot trefoil	F
Cicer milkvetch	F

G - Good adaptation for forage production on this group of soils in this MLRA
F - Fair adaptation but will not produce at its highest potential

Production Estimates

Production estimates listed here should only be used for making general management recommendations. Onsite production information should always be used for making detailed planning and management recommendations.

The high forage production estimates listed below are based on dense, vigorous stands of climatically adapted, superior performing cultivars. They are properly fertilized for high yields and pest infestations are kept below economic thresholds. Mechanical harvests are managed to maintain stand life by cutting at appropriate stages of maturity and harvest intervals. If grazed, optimum beginning and ending grazing heights are adhered to. Adequate time is allowed for plant recovery before entering winter dormancy under both uses.

The production estimates listed below represent total annual above ground plant production on an air-dry-matter basis. Estimates of hay and grazing yields can be calculated from these numbers by multiplying them by a harvest efficiency. A 70 percent harvest efficiency is commonly used when converting to hay yields. Pasture harvest efficiency is highly dependent on the grazing management system applied, ranging from 25 to 50 percent.

Forage Crop	Management Intensity	
	High (lbs/ac)	Low (lbs/ac)
Switchgrass	3400	2000
Tall wheatgrass	5700	3400
Western wheatgrass	3400	2000

Forage Growth Curves

Growth curves estimate the seasonal distribution of growth of the various forage crops. They indicate when the forages may be available for grazing or mechanical harvest.

Growth Curve Number: SD0004
Growth Curve Name: Cool season grass
Growth Curve Description: Cool season grass, statewide

Percent Production by Month

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	10	40	30	10	5	5	0	0	0

Growth Curve Number: SD0005
Growth Curve Name: Warm season grass
Growth Curve Description: Warm season grass, statewide

Percent Production by Month

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	0	0	10	40	35	15	0	0	0	0

Soil Limitations

These soils have severe limitations to the production of climatically adapted forage species. Species selection and productivity are severely limited by the high salinity and/or sodium levels. Also, these soils are somewhat poorly and poorly drained and will experience periods when trafficability will be difficult or impossible. These soils are subject to compaction if grazed or machinery is operated on them when wet. Drainage also limits species selection.

Management Interpretations

When establishing new stands or renovating stands select species that are tolerant of elevated salinity and sodium levels, and that are tolerant of poorly drained soils. Exclude livestock and machinery during extended periods of soil wetness to reduce soil compaction.

FSG Documentation

Similar FSGs:

FSG ID	FSG Narrative
G102BY700S	Subirrigated soils do not have restrictive levels of salinity and/or sodium.
G102BY800S	Claypan soils have better drainage.
G102BY900S	Wet soils do not have restrictive levels of salinity and/or sodium.

Inventory Data References

Agriculture Handbook 296-Land Resource Regions and Major Land Resource Areas
Natural Resources Conservation Service (NRCS) National Water and Climate Center data
USDA Plant Hardiness Zone Maps
National Soil Survey Information System (NASIS) for soil surveys in South Dakota counties in MLRA 102B
South Dakota NRCS South Dakota Technical Guide
NRCS National Range and Pasture Handbook
Various Agricultural Research Service, Cooperative Extension Service, and NRCS research trials for plant adaptation and production.

State Correlation

This site has been correlated with the following states: South Dakota

Forage Suitability Group Approval

Original Author: Tim Nordquist
Original Date:
Approval By: Dave Schmidt
Approval Date: 1/14/03